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Differences in the Timepaths of Service Employment Responses: Rapid Growth and Local Planning

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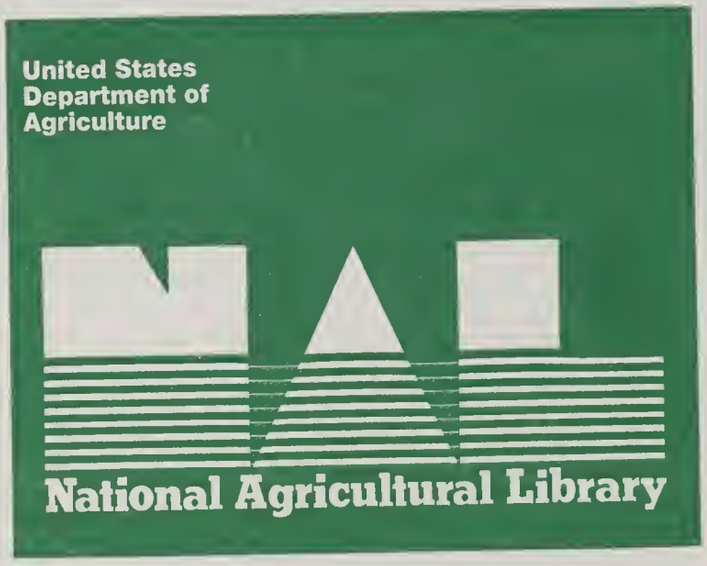
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ABSTRACT

Annual adjustments of nonbasic employment in response to different hypothetical changes in basic income are described. The results illustrate findings of a regression analysis of data from 1971-79 of 30 rural counties that had experienced rapid growth. The analysis produced significant lags in annual nonbasic employment changes in relation to basic income changes. The timing of changes in nonbasic and basic sectors and consequently of population in rapidly growing local economies is a critical element in local fiscal planning.

Keywords: Nonbasic employment adjustments, employment change, rural economic adjustments, rural employment, employment dynamics, infrastructure.

ACKNOWLEDGMENTS

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SUMMARY

Many local planning and impact models estimate equilibrium employment and the consequent population levels with little regard for the year-to-year timing of changes. This study is an initial attempt to characterize the timing of adjustments in nonbasic employment in response to basic income changes for 30 western counties that had experienced rapid growth within any 3-year period from 1972 to 1977. Coefficients from a multiple regression analysis describe the timing of changes in nonbasic employment, assuming different hypothetical patterns of change in basic employment. The analysis resulted in significant relationships between year-to-year changes in nonbasic employment and prior changes in the basic income. While these results cannot be generalized to other rural counties indiscriminately, the findings provide hypotheses and a useful guide for future analyses, and are presented for that purpose.

Three different stylized patterns of hypothetical basic income changes and three different levels of initial basic income are assumed in order to illustrate the results of the multiple regression analysis in terms of the timing of annual adjustments in nonbasic employment. These patterns of basic income change characterize boom-town growth, the establishment of a new industrial facility, and temporary construction projects. The estimated timepaths of annual nonbasic employment changes are different for each case. First in the boom-town case, half the total nonbasic employment adjustments are estimated to be delayed until 4 years after the initial change in basic income. On the other hand, nonbasic employment increases were estimated to come during and immediately after a one-time increase that characterizes a new manufacturing facility. Finally, a one-year increase of basic activity followed the next year by a return to the original level is estimated to bring small upward adjustments in nonbasic employment in the year of change followed in succeeding years by sharp downward adjustments.

Changes in employment, population and demands for local government services are interrelated in most local planning models. Changes in employment signal anticipated population changes. Local government revenues and expenditures in turn are related to population. The timing of changes in employment, and consequently population and local government demands, are critical in the boomtown case: local government infrastructure demands appear to be dampened in the early years of change and somewhat delayed in that case. Tax revenues usually lag the construction and operation of industrial facilities, sometimes by several years. Thus, delays in the demand for local government infrastructure until revenues begin to flow from new industrial developments would tend to aid the fiscal management of local governments. On the other hand employment and population adjustments that come quickly and therefore preceed the flow of tax revenues, such as new manufacturing facilities or temporary construction projects, are much more typical in rural areas, and would appear to complicate local government fiscal management.

Regional cross-section differences among counties also were related to annual nonbasic employment adjustments in the regression analysis. That finding implies that multipliers from case studies can vary greatly among different regional economies and cannot be applied indiscriminately to other economies.

Differences in the Timepaths of Service Employment Responses: Rapid Growth and Local Planning

Lloyd D. Bender [1]

INTRODUCTION

Employment and population are critical elements in the planning process of local governments facing the prospect of rapid growth (Bender and Stinson, 1984, 1981; Weber and Howell, 1982; Stinson and Voelker, 1982; and Murdock and Leistritz, 1979). Estimates of employment are used to estimate future population levels in many formal and informal planning models (Nelson and Bender, 1984). The future population of communities, in turn, is a guide to demands for numerous local government functions and facilities. Thus, employment estimates ultimately affect the estimates of future population and demands for local government infrastructure.

The timing of changes in employment, population, and demands for local government services is also important in planning models. Miscalculations in the timing of construction and operation of local government facilities can lead to inefficient use of tax revenues and undue financial stress due to premature expansions, or, at the other extreme, excess demands.

One step in estimating future employment (hence population and demands for local government services) is to specify the response of nonbasic activities to changes in the economic base by one of several methods (See Richardson, 1978).[2] Yet despite the importance of the timing of employment changes in local planning models, few adequately take it into account (Shaffer, 1979). Analysts most often apply static concepts and estimation techniques in order to define new equilibrium levels of employment toward which economies will move in succeeding years (Nelson and Bender, 1985). When the timing of such changes is provided as a part of planning models, that timing is usually specified by assumption and often has little empirical justification. The reason is understandable: debate concerning the timing of nonbasic employment adjustments in response to economic growth continues even in recently published studies.

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[2] Nonbasic activities (an aggregation of service sectors) in a local economy are derived demands from income generated by the production and sale of goods to people outside the local economy, and from other income sources outside the local economy. Note from the outset that nonbasic employment is a fundamental component of planning models, but that basic income is a superior reflection of demand. Thus, nonbasic employment is a function of basic income.

McNulty (1977, p. 361-2) aptly summarizes the early and as yet unresolved debate between North (1956, 1955) and Tiebout (1962, 1956a, 1956b) regarding the suitability of economic base theory for shortrun and longrun analyses of the growth of regions. In addition, recent empirical analyses offer contradictory conclusions. McNulty (1977, p. 367) concludes in his empirical analysis that "...the economic base theory...[provides]...a very poor explanation of short-run regional economic developments...." On the other hand, Henry and Nyankori (1981, p. 456) present opposing empirical results, finding that "...basic employment changes will affect nonbasic employment changes over a two-year period...." Finally, Bender and Parcels (1983) found that rapid basic employment increases were followed by decreases in the ratio of nonbasic to basic employment, and concluded that the differences in responses among counties were due to economic structures.

PURPOSE

This report describes and interprets the timepaths of nonbasic employment adjustments in 30 rural counties that had experienced a period of rapid growth. An association between nonbasic and basic activities is assumed. This association is an aggregate economic base multiplier: the ratio of nonbasic employment to basic income, adjusted for trend. However, no assumptions are made with respect to how many years is taken for the multiplier effect to work itself out. This ratio is statistically associated with the level, and its change in the immediate past, of basic activities as well as with regional variables that may be associated with differences in local nonbasic employment levels and responses.

Past changes in basic economic activities that are significantly related to the observed annual average multiplier ratio in succeeding years imply that nonbasic employment changes will lag somewhat after changes in basic activities. The amount and degree of lag is an open empirical question. The statistical association between the multiplier ratio and present and past changes in basic income allows estimates of nonbasic employment changes to be made for various hypothetical patterns of change in basic activities. The hypothetical patterns of change in basic income are exaggerated and stylized in this report in order to illustrate differences in timepaths of the estimated responses of nonbasic employment. Finally, the lags in nonbasic employment adjustments are discussed briefly in relation to potential local government planning problems in each stylized case.

DATA

The definitions, data, methodology, and the specification of the problem reflect a primary objective of describing the timepath of nonbasic employment adjustments in response to changes in basic income in rapidly growing rural economies. First, the data are observations of rapid growth situations that may not be typical of the average rural economy. Second, the use of annual cross-section observations through time requires that regional differences (cross-section differences) be separated from the timepath of adjustments that are due to basic income changes. Third, observations of county units that are noncontiguous minimize the spatial interdependence within the data set and therefore circumvent that statistical problem. Finally, the specification of the regression presumes a relationship between nonbasic employment and basic income. This ratio of nonbasic employment to basic income is specified as being a function of the independent variables of the regression equation, including lagged changes in basic income.

Annual employment and income data for 1971-79 from the Regional Economic Information System of the Bureau of Economic Analysis, U. S. Department of Commerce, are used in this study, supplemented by other data from COUNTY BUSINESS PATTERNS (U. S. Department of Commerce). The data for 1971-74 provide only lagged variables, and the contemporaneous effects are reflected in the 1975-79 data.

The data are for 30 growth counties from among 345 rural western counties.[3] Each growth county had at least a 15-percent or greater increase in basic employment in any 3-year period from 1972 to 1977.[4] The "high 3-year change" in basic employment averaged 32 percent for the 30 counties.

The wide geographic spread of counties and the absence of coterminous counties eliminated spatial interdependence problems.[5] The 30 counties are located in the 10 States north and west of Kansas.[6] None was adjacent to a Standard Metropolitan Statistical Area (SMSA) or a large regional trade center. The cross-section differences between counties may be magnified by the selection process.

THE ANALYSIS

Stylized timepaths of nonbasic employment adjustments are calculated from coefficients of a multiple regression equation estimated from the data. The equation specifies the effect of basic income, and its lagged changes from year to year, on the county ratio of nonbasic employment to basic income. Employment is an important component of planning models, yet basic income is a superior indicator of demand. Cross-section differences are taken into account by county dummies, and variables measuring regional characteristics that change during rapid economic growth. Results of ordinary least squares (OLS) regressions with and without county dummies plus results from the application of the Cochrane-Orcutt procedure are presented for comparison.[7] After a brief presentation of regression results, the estimated time paths of nonbasic employment are presented for three stylized patterns of hypothetical changes in basic income in three economies with different size economic bases. Coefficients from the Cochrane-Orcutt procedure are used in these illustrations.

The dependent variable in the regression analysis is the ratio of county nonbasic employment divided by basic income in the county, which, in turn, is expressed relative to the national ratio of nonbasic to basic employment.[8][9] It corrects for the long-term upward trend in nonbasic employment in the Nation.[10] The independent variables are in two groups: the effects of basic

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[3] Note below that the time period used to screen counties for growth is shorter than that used in the regression in order to allow for lagged responses, and only employment data were used in that screening. See Bender and Parcels (1983) for a complete description of the screening procedure used to select the initial 345 rural counties.
[4] Nine had at least a 15-percent increase in basic employment between the end of 1974 and 1977, 8 between 1973 and 1976, and 13 between 1972 and 1975.
[5] Spatial interdependence between units of observation biases downward the standard error of the regression.
[6] The mean number of counties per state was three, and the range was six from Wyoming to one from California and Oregon.
[7] The Cochrane-Orcutt procedure addresses the problem of a downward bias in standard errors due to serial correlation, hence unwarranted rejections of null hypotheses (Pindyck and Rubinfeld, 1976, pp. 106, 111).

income and its changes in prior years, and regional variables likely to change during rapid growth (table 1).[11]

The statistical results indicate that adjustments in nonbasic employment tend to lag changes in basic income (table 2). First, the coefficients on all four lagged variables are negative. The coefficient on the level of basic income reflects its contribution to an equilibrium value of the dependent variable. The negative coefficients on the lagged fraction change in basic income successively prevent the full equilibrium adjustment from coming about. Second, the absolute values of the lag coefficients decline with the passage of time. Thus in each succeeding year, the adjustment moves closer toward the estimated equilibrium. Third, the coefficient on basic income in the current year and three of the four lagged fraction changes in basic income are significant in the Cochrane-Orcutt analysis.

An increase in the first year in basic income (in year t from a stable level) is reflected by the coefficients on the variables BasYt, real base sector earnings; InvBasYt, the inverse of BasYt; and BasYt-1, the fraction change from the prior year in basic income.[12] The sign on the coefficient BasYt means that the new equilibrium value of the nonbasic ratio will tend to decline as the level of basic income increases in local economies. This result is consistent with that reported earlier by Bender and Parcels (1983): with local economic growth, nonbasic activities increase at a slower rate than basic activities.[13] The variable InvBasYt (the inverse of BasYt) is simply a nonlinear adjustment of the effect of the variable BasYt. Although its sign is positive, the coefficient is not significant from zero, and its effect diminishes with larger levels of basic income.[14]

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[8] Agriculture, mining, manufacturing, and heavy construction are assumed to be basic sectors. Location quotients were used to derive the basic component of light construction, railroad, communication, public utilities, State and local government, and hotel and motel sectors. Farm proprietor's income used here is an average over the whole period because of the distortions to reported farm income in this period accompanying the sale of wheat to Russia. See Isserman (1980) for alternative methods.

[9] The term "service ratio" is used for convenience in place of the phrase "the ratio of nonbasic employment to real basic income".

[10] Note that only employment data are in the U. S. ratio in contrast to the county ratio. Projections of U. S. employment are available, while projections of future income by sectors are not. Planning and impact models are constrained to use readily available secondary data. The ratio of U. S. nonbasic to basic employment increased from 1.25 in 1979 to 1.475 in 1979 as it is defined here.

[11] See Parcels (1984) for detailed justification of the variables used in this specification. See Gerking and Isserman (1981) for an analysis of the effect of definitions and specifications on the timing of adjustment estimates.

[12] The highest correlation coefficient between any base income measure used as an independent variable and the dependent variable is -0.227, and among those that are independent variables, the highest is 0.206, with the exception of BasYt and its inverse, which is -0.61.

[13] This empirical observation may reflect differences in the ratio of capital to labor, among other things, or simply differences in the utilization of part-time labor as the service economy grows.

[14] The lack of significance may be due to correlation with BasYt.

Table 1: Definitions and hypotheses

Variables	Description of variables	Hypotheses	Expected sign
Dependent variable			
ServBasYt	(Nonbasic employment/ basic income)/(U.S. nonbasic/basic empl.)	County ratio moves with U.S. ratio.	
Independent variables			
Current real basic income effects			
BasYt	Real base earnings in t, (000 in 1967 $)	ServBasy declines as BasY increases.	-
InvBasYt	Inverse of BasYt	Scaling adjustment for economic base size.	+
Lagged basic income effects			
BasYt-1	[(BasYt)-(BasYt-1)]/ BasYt-1	1st year delay in adjustment to equilibrium.	-
BasYt-2	[(BasYt-1)-(BasYt-2)]/ BasYt-2	2nd year delay in adjustment to equilibrium.	-
BasYt-3	[(BasYt-2)-(BasYt-3)]/ BasYt-3	3rd year delay in adjustment to equilibrium.	-
BasYt-4	[(BasYt-3)-BasYt-4)]/ BasYt-4	4th year delay in adjustment to equilibrium.	-
Regional characteristics that change with growth			
Waget-1	[(Real wage and salary earnings/wage and salary workers) t-1]/ U.S. earnings per wage and salary worker t-1	High wages ration labor to service firms.	-
RTP	Pop.largest cnty.town/ county population	Service offerings are centralized. Serves other counties.	-
FarmPt	No. farm proprietors/ total employment	Mix and distribution of services are different.	-
AdjTS	[ln(adj. town pop./pop. largest cnty. town)/] distance between towns	Large competing towns attract business from the county.	-
Constants	Each county has an Intercept	Regional cross-section differences are important.	

Table 2: Regression results [a][b]

Item/variables	Ordinary least squares: No dummies	Ordinary least squares: County dummies	Cochrane-Orcutt with county dummies
Adjusted R sq.	0.66	0.97	0.91
S.E.	0.034	0.010	0.008
F value	29.69	123.75	43.44
d.f.	10, 139	39, 110	39, 110
Independent variables			
Current real basic income effects			
BasYt	-0.45 E-06	-0.14 E-05	-0.11 E-05
	(3.30)	(13.87) **	(5.37) *
InvBasYt	-272.28	247.62	128.93
	(12.88) **	(9.86) **	(1.90)
Lagged basic income effects			
BasYt-1	-0.94 E-01	-0.35 E-01	-0.53 E-01
	(32.04) **	(20.98) **	(57.92) **
BasYt-2	-0.38 E-01	-0.17 E-01	-0.27 E-01
	(4.80) *	(7.01) **	(16.73) **
BasYt-3	-0.34 E-01	-0.15 E-01	-0.14 E-01
	(3.20)	(5.04) *	(6.18) *
BasYt-4	-0.32 E-01	-0.11 E-01	-0.55 E-02
	(2.63)	(2.32)	(1.26)
Regional characteristics that change with growth			
Waget-1	-4.71	-0.96	-0.92
	(102.99) **	(3.14)	(4.39) *
RTP	0.08	-0.30	-0.23
	(16.87) **	(30.29) **	(21.90) **
FarmPt	-0.34	-0.37	-0.61
	(24.92) **	(12.10) **	(35.65) **
AdjTS	0.28	-2.02	-1.78
	(2.89)	(15.65) **	(12.48) **
Constant	0.39	0.43 [c]	0.41 [c]

[a] The dependent and independent variables are defined in Table 1.
[b] Numbers in parentheses are F values, * is 5 percent and ** 1 percent levels, and the expressions E-0X scale the decimal X positions to the left.
[c] Median constant for all counties.

The first lag variable, BasYt-1 (the fraction change in basic income from the prior year) also takes effect in the year of change. It prevents the full adjustment to equilibrium in the nonbasic ratio from taking place in the first year. Likewise, each successive year after the change, the full equilibrium is prevented from taking place by each successive lag coefficient, but by smaller increments as each year passes.[15] The specification of the equation arbitrarily limits the number of lags, and hence the last one arbitrarily captures all of the remaining adjustments to the equilibrium value.

Regional cross-section differences are of secondary importance in this analysis. They are included in order to adjust for regional variables that change as growth occurs. Two used here are conventional: the size of the largest town in relation to the county population (RTP), and the size of the largest town relative to the size and distance to its nearby adjacent competitors (AdjTS).[16] The sign on the coefficient of RTP is negative, meaning that the observed nonbasic ratio is smaller in counties with a larger proportion of population in their largest town. The variable AdjTS has a negative coefficient: a large nearby town tends to siphon demand from counties with a small town.

Two additional background variables are not conventionally used in economic base analysis. The first is a wage variable lagged 1 year, Waget-1, measured by annual real earnings per wage and salary worker and scaled by the U. S. wage. High wages in rapid growth communities are expected to bid labor away from low-paying jobs in the nonbasic sectors, and hence the nonbasic ratio should decrease as wages increase. The remaining continuous variable is the number of farm proprietors in relation to total employment (FarmPt). Farm economies have a different mix and spatial distribution of service sectors, and the purchase of supplies and marketing services from year to year is not accurately portrayed by the variability of farm income.

Dummy variables allow each county intercept to be different due to circumstances unique to that county and that remain fixed throughout the period. Their advantage in this instance is that the measurement of the timing of adjustments is sharpened because more of the background variation has been removed than can be by using conventional continuous variables.

It appears that the regional differences that have been specified by the continuous variables are important, but that unspecified regional differences are also important. The proportion of variation explained by the OLS regression increased substantially with the inclusion of dummy county variables, an indication that the continuous variables failed to capture all of the cross-section variation in the data. The standard error of the regression also declined from 25 percent of the mean of the dependent variable to 7 percent when county dummies were included in the OLS equation. Finally, the regional variables have expected signs, have reasonable coefficients, and are significant. Thus, it appears that regional cross-section differences are important sources of variation among local multipliers.

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[15] The largest correlation coefficient between any of the lagged base income variables is 0.04, and between them and any other variable in the equation is 0.33 (between BasYt-4 and the lagged wage variable).

[16] AdjTS is [ln(adjacent town population/population of the largest town in the county)]/distance between the towns. The largest value for any feasible alternative town was used as the observation. The log of the numerator scales down the disparity in observed ratios.

THE TIMING OF ADJUSTMENTS

Evaluations of the regression equation under different hypothetical patterns of change in basic income illustrate expected differences in magnitudes and timepaths of nonbasic employment adjustments. Each hypothetical situation typifies different kinds of industrial developments.

Paths of Change: The Average Case

Each hypothetical development in the "average" county of the observation set provides a general description of the estimated timing of nonbasic employment adjustments (table 3).

First, a "boom-town" situation is represented by the "cumulative increase" case characterized by 20-percent increases in basic income in each of 4 consecutive years. The cumulative effect results in an estimated 62-percent total increase in nonbasic employment after 8 years. But the estimated timing of that increase is of interest. Over half of the total increase would have come in the last 4 years. That lag seems justifiable. First, nonbasic sectors may initially have some excess capacity upon which to draw. Second, entrepreneurs may be fully aware of potential opportunities, but may not expand owing to severe competition for labor from high-paying basic sector jobs under these rapid growth conditions. Probably most important, however, are housing shortages in rapid growth rural communities. Workers may be forced to live in other areas until housing becomes available, delaying increases in the local demand for services.

Second, a "one-time increase" in basic income of 20 percent, after which it stabilizes at the new higher level, may characterize a new manufacturing or mining facility in a rural area. That new and higher level is accompanied by an estimated 15-percent increase in nonbasic employment. The adjustment is

Table 3: Nonbasic employment adjustments to assumed basic income changes in the average county [a]

Year	Assumed 20 percent basic income changes								
	Cumulative increases			One-time increase			1-year increase		
	Non-basic empl.	Index n-basic empl.	Cumul. empl. change	Non-basic empl.	Index n-basic empl.	Cumul. empl. change	Non-basic empl.	Index n-basic empl.	Cumul. empl. change
	No.	Percent		No.	Percent		No.	Percent	
Initial	3,690	100	0	3,690	100	0	3,690	0	0
Change	3,850	104	7	3,850	104	30	3,850	104	100
Two	4,118	112	19	4,035	109	64	3,792	103	63
Three	4,419	120	32	4,125	112	80	3,738	101	30
Four	4,718	128	45	4,192	114	93	3,731	101	25
Five	5,376	146	74	4,231	115	100	3,717	101	17
Six	5,714	155	89	4,231	115	100	3,690	100	0
Seven	5,897	160	97	4,231	115	100	3,690	100	0
Eight	5,965	162	100	4,231	115	100	3,690	100	0

[a] Initial basic income is assumed to be that of the sample average. All regional conditions are assumed to be those of the sample average.

estimated to be 80-percent completed by the second year after the change: over one-third of that adjustment comes in the year of change.

Third, a "one-year increase" in basic income of 20 percent, followed the next year by a return to the original level, represents highway, power, communications, or dam construction projects that result in few operating and maintenance workers after the initial construction. In this case, a first-year response of 160 new nonbasic employees is estimated, followed by a decline of 112 in the next 2 years, and finally a slow return to the original levels.

Paths of Change: Large and Small Economies

The patterns of nonbasic employment adjustments may be substantially different in economies that are much larger or smaller than the average of the observed set. Estimated adjustment patterns are explored in tables 4 and 5 for economies with levels of basic income 25 percent larger and smaller than the average of the data set. These results caution against indiscriminately applying multipliers from other case studies, or from aggregate analyses, to local situations.

Observe first that the adjustments are estimated to be relatively smaller in the large economy (table 4) than the small economy (table 5). The total nonbasic employment change in the cumulative increase case is estimated to be 72 percent in the small economy versus 49 percent in the large one. While the "1-year increase" case produces a 6-percent nonbasic employment peak in the small economy, the peak is 3 percent in the large economy.

Second, the year-to-year patterns of change are different. The pattern is very smooth in the small economy with cumulative basic income increases, but clustered in the last 4 years in the large economy. The same pattern of early nonbasic employment adjustments in the small economy is apparent in the other two cases. Nonbasic employment peaks in the year after the development in the large economy, but in the year of change in the small economy for the 1-year case.

These results suggest alternative hypotheses. The county with a small economic base likely is surrounded by places from which labor can be drawn, for instance. Or, labor force participation rates initially may not be high, and may increase. Finally, the wage response and labor rationing effect may not be severe. Thus, several additional avenues of research are suggested.

DISCUSSION

The timing of nonbasic employment adjustments in response to rapid growth affects the timing of expected population levels and hence planned infrastructure. Any delayed response of nonbasic employment adjustments to a basic income change means that additional population and infrastructure requirements also will be delayed to some extent. Since new tax revenues from industrial developments often lag after construction and operation of facilities, any delay in population increases would tend to reduce pressures for new local government infrastructure outlays during periods when local government revenues have not reached their full potential. This result would be especially important in communities with consecutive years of rapid growth. That is the case where adjustments are estimated to be delayed the most, with one half of the estimated increase in nonbasic employment coming 4 years after the industrial development.

Table 4: Nonbasic employment adjustments to assumed basic income changes in the above average county [a]

Year	Assumed 20 percent basic income changes								
	Cumulative increases			One-time increase			1-year increase		
	Non-basic empl.	Index n-basic empl.	Cumul. empl. change	Non-basic empl.	Index n-basic empl.	Cumul. empl. change	Non-basic empl.	Index n-basic empl.	Cumul. empl. change
	No.	Percent		No.	Percent		No.	Percent	
Initial	4,358	100	0	4,358	100	0	4,358	0	0
Change	4,466	102	5	4,466	102	18	4,466	102	85
Two	4,667	107	14	4,697	108	58	4,485	103	100
Three	4,853	111	23	4,810	110	77	4,418	101	47
Four	4,952	114	28	4,893	112	92	4,409	101	40
Five	5,774	133	66	4,942	113	100	4,392	101	27
Six	6,197	142	85	4,942	113	100	4,358	100	0
Seven	6,426	147	96	4,942	113	100	4,358	100	0
Eight	6,511	149	100	4,942	113	100	4,358	100	0

[a] Initial income is assumed to be 1.25 that of the sample average. All regional conditions are assumed to be those of the sample average.

Table 5: Nonbasic employment adjustments to assumed basic income changes in the below average county [a]

Year	Assumed 20 percent basic income changes								
	Cumulative increases			One-time increase			1-year increase		
	Non-basic empl.	Index n-basic empl.	Cumul. empl. change	Non-basic empl.	Index n-basic empl.	Cumul. empl. change	Non-basic empl.	Index n-basic empl.	Cumul. empl. change
	No.	Percent		No.	Percent		No.	Percent	
Initial	2,939	100	0	2,939	100	0	2,939	0	0
Change	3,114	106	8	3,114	106	38	3,114	106	100
Two	3,394	115	21	3,253	111	68	3,015	103	43
Three	3,735	127	38	3,320	113	83	2,974	101	20
Four	4,124	140	56	3,370	115	94	2,969	101	17
Five	4,618	157	79	3,400	116	100	2,959	101	12
Six	4,871	166	91	3,400	116	100	2,939	100	0
Seven	5,009	170	98	3,400	116	100	2,939	100	0
Eight	5,060	172	100	3,400	116	100	2,939	100	0

[a] Initial basic income is assumed to be three-fourths that of the sample average. All regional conditions are assumed to be those of the sample average.

At the other extreme, nonbasic employment adjustments that accompany or follow immediately after an expansion of industrial activities may complicate the fiscal planning of local governments. This development scenario is more typical of those in rural areas as a result of expanded manufacturing activities. Early increases in nonbasic employment and population place added demands on local governments at a time when new industrial revenues may not have reached their full potential.

Finally, a temporary spurt in basic activity that falls back to the original level illustrates the case of large construction projects that are common in rural areas. Expansions of local government infrastructure are demanded, yet added tax revenues are not expected. In such cases, local residents absorb the effects of any temporary inadequacy in local government services. The cost, in effect, is a period of excess demand for the services that are available.

The lags in adjustments might be somewhat of an aid to fiscal management in the case of "boom towns". However in the two cases that are more common in rural areas, rapid adjustments in nonbasic employment and eventually in population appear to complicate the problems of fiscal management.

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